PE CS

PTO/SB/21 (02-04) Approved for use through 07/31/2006. OMB 0651-003U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. Application Number 10/614,716 **TRANSMITTAL** Filing Date 07/07/2003 FORM First Named Inventor Sreenivasan et al. Art Unit 1732 (to be used for all correspondence after initial filing) **Examiner Name** Unassigned Attorney Docket Number P90/MII-51-33V50 Total Number of Pages in This Submission **ENCLOSURES** (Check all that apply) After Allowance communication Fee Transmittal Form Drawing(s) to Technology Center (TC) Appeal Communication to Board Licensing-related Papers Fee Attached of Appeals and Interferences Appeal Communication to TC Petition (Appeal Notice, Brief, Reply Brief) Amendment/Reply Petition to Convert to a Proprietary Information After Final Provisional Application Power of Attorney, Revocation Status Letter Affidavits/declaration(s) Change of Correspondence Address Other Enclosure(s) (please Terminal Disclaimer Extension of Time Request Identify below): Form 1449 - IDS Request for Refund **Express Abandonment Request** Forty-two (42) References Return Receipt Postcard to K. C. Brooks CD, Number of CD(s) Information Disclosure Statement Remarks Certified Copy of Priority Document(s) Response to Missing Parts/ Incomplete Application Response to Missing Parts under 37 CFR 1.52 or 1.53 SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT Firm Law Office of Kenneth C. Brooks Individual name Signature Date CERTIFICATE OF TRANSMISSION/MAILING I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below. Typed or printed name Alexis Sheffield Date Signature

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:Sreenivasan et al.PATENT APPLICATIONSerial No.:10/614,716Group Art Unit:1732Filing Date:July 7, 2003Examiner:Unassigned

For: A CONFORMING TEMPLATE FOR PATTERNING LIQUIDS DISPOSED

ON SUBSTRATES

## INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents Alexandria, VA 22313

#### Sir:

The following information is submitted in compliance with Applicants' duty of disclosure under 37 C.F.R. § 1.56. Form PTO-1449 and a copy of each reference recited below accompanies this document. It is respectfully requested that the cited information be expressly considered during the prosecution of this application, and the references be made of record therein and appear among the "references cited" on any patent to issue therefrom.

#### ISSUED PATENTS

Patent Number 4,724,222	<u>Inventor</u> Feldman	Grant Date 02/09/1988
4,731,155	Napoli et al.	03/15/1988
5,425,848	Haisma et al.	06/20/1995
5,669,303	Maracas et al.	09/23/1997
5,772,905	Chou	06/30/1998
5,900,160	Whitesides et al.	05/04/1999
5,948,470	Harrison et al.	09/07/1999
6,039,897	Lochhead et al.	03/21/2000
6,309,580	Chou	10/30/2001
6,334,960	Willson et al.	01/01/2002
6,518,168	Clem et al.	02/11/2003

## PENDING PATENT APPLICATIONS

Serial Number 09/698,317	<u>Inventor</u> Choi et al.	Filing Date 10/27/2000
09/907,512	Sreenivasan et al.	07/16/2001
09/908,455	Choi et al.	07/17/2001
09/920,341	Choi et al.	08/01/2001
09/976,681	Bailey et al.	10/12/2001
10/136,188	Voisin	05/01/2002p
10/194,414	Sreenivasan et al.	07/11/2002
10/194,991	Sreenivasan et al.	07/11/2002
10/293,224	Choi et al.	11/13/2002
10/293,919	Voisin	11/13/2002
10/316,963	Choi et al.	12/11/2002
10/735,110	Nimmakayala et al.	12/12/2003

#### FOREIGN PATENT DOCUMENTS

Document Number	<u>Inventor</u>	<u>Pub. Date</u>
DE 2800476	Lamprecht et al.	07/13/1978
JP 1-196749	Matsumoto et al.	08/08/1989
WO 01/69317	Montelius et al.	09/20/2001
WO 01/79592	Hallberg et al.	10/25/2001
WO 01/90816	Heidari	11/29/2001

### NON-PATENT DOCUMENTS

- Krug, Herbert et al. "Fine Patterning of Thin Sol-Gel Films,"
  Journal of Non-Crystalline Solids, 1992, 447-450.
- Krauss, et al. "Fabrication of Nanodevices Using Sub-25nm Imprint Lithography," Appl. Phys. Lett., 67(21), 3114-3116, 1995.
- Chou et al. "Imprint of Sub-25 nm Vias and Trenches in Polymers," Applied Physics Letters, 67(21), pp. 3114-3116, 1995.
- Chou et al. "Imprint Lithography with 25-Nanometer Resolution," Science, vol. 272, Apr. 5, 1996, pp. 85-87.

- Haisma, J. et al. "Mold-Assisted Nanolithography: A Process for Reliable Pattern Replication," Journal of Vacuum Science and Technology, 1996, 14, 4124-4128.
- Chou et al. "Imprint Lithography with Sub-10 nm Feature Size and High Throughput", Microelectronic Engineering 35, 1997, 237-240.
- Feldman et al., "Wafer Chuck for Magnification Correction in X-ray Lithography," American Vacuum Society, 1998, pp. 3476-3479.
- Scheer, H.C. et al. "Problems of Nanoimprinting Technique for Nanometer Scale Pattern Definition," Journal of Vacuum Science and Technology, 1998, 16, 3917-3921.
- Colburn, M. et al. "Step and Flash Imprint Lithography: New Approach to High-Resolution Patterning," Proc. of SPIE, 1999, 3676, 379-389.
- Chou, Stephen et al. "Lithographically-induced Self Assembly of Periodic Micropillar Arrays," Journal of Vacuum Science and Technology, 1999, 17, 3197-3202.
- Ruchhoeft, P. et al. "Patterning Curved Surfaces: Template Generation by Ion Beam Proximity Lithography and Relief Transfer by Step and Flash Imprint Lithography," Journal of Vacuum Science and Technology, 1999, 17, 2965-2982.
- Choi, B.J. et al. "Design of Orientation Stages for Step and Flash Imprint Lithography," Precision Engineering, 2001, 25, 192-199.

Otto M. et al., "Step and Repeat UV-Nanoimprint Lithography: Material Issues," Nanoimprint and Nanoimprint Technology Conference, San Francisco, December 11-13, 2002.

Johnson et al., "Advances in Step and Flash Imprint Lithography, " SPIE Microlithography Conference, February 23-28, 2003.

CERTIFICATE OF MAILING Submitted, I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: PATENT APPLICATION, for Patents, Commissioner

Alexandria VA (22)13.
Signed: Whytherefield
Typed: Alexis Sheffield
Date: March 11, 2004

Respectfully

Kenneth C. Brooks Reg. No. 38393

P.O. Box 10417

Austin, Texas 78766-1417 Telephone: 512-527-0104 Facsimile: 512-527-0107 patentsrus@earthlink.net

Approved for use through 10/31/2002. OMB 0651-0031 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

der the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

ubstitute for form 1449A/PTO

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 1 of

Complete if Known				
Application Number 10/614,716				
Filing Date	07/07/03			
First Named Inventor	Sreenivasan et al.			
Group Art Unit	1732			
Examiner Name	Unassigned			
Attorney Docket Number	P90/MII-51-33V50			

U.S. PATENT DOCUMENTS								
Examiner Initials*	Cite No.1	U.S. Patent Do	Kind Code <sup>2</sup> (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear		
	A1	4,724,222		Feldman	02-09-1988			
	A2	4,731,155		Napoli et al.	03-15-1988			
	A3	5,425,848		Haisma et al.	06-20-1995			
·	A4	5,669,303		Maracas et al.	09-23-1997			
	A5	5,772,905		Chou	06-30-1998			
	A6	5,900,160		Whitesides et al.	05-04-1999			
	A7	5,948,470		Harrison et al.	09-07-1999			
	A8	6,039,897		Lochhead et al.	03-21-2000			
	A9	6,309,580		Chou	10-30-2001			
	A10	6,334,960	1	Willson et al.	01-01-2002			
	A11	6,518,168		Clem et al.	02-11-2003			
	1 1							
	<u> </u>			-				
· -					<del>  </del>			
	-		-					
	<del>                                     </del>					***************************************		
		<del></del>	<del></del>		<del> </del>			
· · · · · · · · · · · · · · · · · · ·			<u> </u>		<del>                                     </del>	<del> </del>		
					<del>                                     </del>			
					†			
	1							
	1		1					
	<del> -</del>							
	+-+		+					
	<del>  -</del>							
<del></del>	<del>                                     </del>							
Examiner			Marketon of the state of		Date			
Signature					Considered			

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>&</sup>lt;sup>1</sup>Unique citation designation number. <sup>2</sup>See attached Kinds of U.S. Patent Documents. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language Translation is attached.

Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
the application of information unloss it displays a valid OMB control number.

Under the F	aperwork Reduction Act o	i 1995, r	o persons are required to	respond to a collection of information un	ess it displays a valid OMB control number.	
Substitute for form 1449A/PTO			· · · · · · · · · · · · · · · · · · ·	Complete if Known		
				Application Number	10/614,716	
INFORMATION DISCLOSURE				Filing Date	07/07/03	
STATEMENT BY APPLICANT		First Named Inventor	Sreenivasan et al.			
				Group Art Unit	1732	
(	use as many sheets	as nec	essary)	Examiner Name	Unassigned	
Sheet	2	of	5	Attorney Docket Number	P90/MII-51-33V50	

				FOREIGN	PATENT DOCUMENTS			
Examiner Initials*	Cite No.1	Office <sup>3</sup>	Foreign Patent Docum		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sub>6</sub>
	A12	DE	2800476		Lamprecht et al.	07-13-1978		
	A13	JP	1-196749		Matsumoto et al.	08-08-1989		
	A14	wo	01/69317		Montelius et al.	09-20-2001		
	A15	wo	01/79592		Hallberg et al.	10-25-2001		
	A16	wo	01/90816		Heidari	11-29-2001		
	-					•		
•					,			-
,								
	-							+
						-		-
								ļ
	_							+-
								-
								1
								+-
								1
								+

Examiner	<i>\( \lambda \)</i>	Date	
Signature		Considered	

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>&</sup>lt;sup>1</sup>Unique citation designation number. <sup>2</sup>See attached Kinds of U.S. Patent Documents. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language Translation is attached.

→	+

PTO/SB/08A (08-00)

Approved for use through 10/31/2002. OMB 0551-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Substit	ute for form 1449B/	PTO		Complete if Known		
				Application Number	10/614,716	
INFORMATION DISCLOSURE				Filing Date	07/07/03	
STATEMENT BY APPLICANT		First Named Inventor	Sreenivasan et al.			
				Group Art Unit	1732	
(use as many sheets as necessary)		Examiner Name	Unassigned			
Sheet	3	of	- 5	Attorney Docket Number	P90/MII-51-33V50	

OTHER PRIC	R ART - I	NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite, No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	A17	KRUG et al., "Fine Patterning of Thin Sol-Gel Films," Journal of Non-Crystalline Solids, 1992, pp. 447-450, vol. 147 & 148.	
	A18	Krauss et al., "Fabrication of Nanodevices Using Sub-25nm Imprint Lithography," Appl. Phys. Lett 67(21), 3114-3116, 1995	
	A19	CHOU et al., "Imprint of Sub-25 nm Vias and Trenches in Polymers," Applied Physics Letters, November 20, 1995, pp. 3114-3116, vol. 67(21).	
	A20	CHOU et al., "Imprint Lithography with 25-Nanometer Resolution," Science, Apr. 5, 1996, pp. 85-87, vol. 272.	
	A21	HAISMA et al., "Mold-Assisted Nanolithography: A Process for Reliable Pattern Replication," Journal of Vacuum Science and Technology, Nov/Dec 1996, pp. 4124-4128, vol. B 14(6).	
	A22	CHOU et al., "Imprint Lithography with Sub-10nm Feature Size and High Throughput," Microelectronic Engineering, 1997, pp. 237-240, vol. 35.	
	A23	FELDMAN et al., "Wafer chuck for manification correction in x-ray lithography," American Vacuum Society, 1998, pp. 3476-3479.	
	A24	SCHEER et al., "Problems of the Nanoimprinting Technique for Nanometer Scale Pattern Definition,"  Journal of Vacuum Science and Technology, Nov/Dec 1998, pp. 3917-3921, vol. B 16(6).	
	A25	COLBURN. et al., "Step and Flash Imprint Lithography: A New Approach to High-Resolution Patterning", Proc. of SPIE, 1999, pp. 379-389, vol. 3676.	
	A26	CHOU et al., "Lithographically-Induced Self Assembly of Periodic Polymer Micropillar Arrays," Journal of Vacuum Science and Technology, Nov/Dec 1999, pp. 3197-3202, vol. B 17(6).	
	A27	RUCHHOEFT et al., "Patterning Curved Surfaces: Template Generation by Ion Beam Proximity Lithography and Relief Transfer by Step and Flash Imprint Lithography," Journal of Vacuum Science and Technology, 1999, pp. 2965-2982, vol. 17.	

	The second secon		
Examiner		Date	
Signature		Considered	The second secon

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>&#</sup>x27;Unique citation designation number. <sup>2</sup>Applicant is to place a check mark here if English language Translation is attached.

PTO/SB/08A (08-00)

Approved for use through 10/31/2002. OMB 0651-0031 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE to a collection of information unless it displays a valid OMB control number.

Index the Panerwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Substitute for form 1449B/PTO				Complete if Known	
Substitute for form 1443B/1 TO				<b>Application Number</b>	10/614,716
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Filing Date	07/07/03
				First Named Inventor	Sreenivasan et al.
				Group Art Unit	1732
(use as many sheets as necessary)			ecessary)	Examiner Name	Unassigned
Sheet	4	of	5	Attorney Docket Number	P90/MII-51-33V50

		NON PATENT LITERATURE DOCUMENTS  Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the	T <sup>2</sup>
Examiner nitials*	No.	item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	<u>'</u>
		CHOI et al., "Design of Orientation Stages for Step and Flash Imprint Lithography," Precision Engineering,	ł
	A28	Journal of the International Societies for Precision Engineering and Nanotechnology, 2001, pp. 192-199, vol. 25.	
	+ -	CHOI et al., "High Precision Orientation Alignment and Gap Control Stages for Imprint Lithography	1-
	A29	Processes," U.S. Patent Application 09/698,317. Filed with USPTO on October 27, 2000.	
	-	SREENIVASAN et al., "High-Resolution Overlay Alignment Methods and Systems for Imprint Lithography,"	
	A30	U.S. Patent Application 09/907,512. Filed with USPTO on July 16, 2001.	
		CHOI et al., "Method and System of Automatic Fluid Dispensing for Imprint Lithography Processes," U.S.	
	A31	Patent Application 09/908,455. Filed with USPTO on July 17, 2001.	
	_	CHOI et al., "Methods for High-Precision Gap and Orientation Sensing Between a Transparent Template	
	A32	and Substrate for Imprint Lithography," U.S. Patent Application 09/920,341. Filed with USPTO on August	
		1, 2001.	↓_
		BAILEY et al., "Template for Room Temperature Low Pressure Micro- and Nano-Imprint Lithography," U.S.	
	A33	Patent Application 09/976,681. Filed with USPTO on October 12, 2001.	
		VOISIN, "Methods of Manufacturing a Lithography Template," U.S. Patent Application 10/136,188, Filed	
	A34	with USPTO on May 1, 2002.	
		SREENIVASAN et al., "Step and Repeat Imprint Lithography Systems," U.S. Patent Application	
	A35	10/194,414. Filed with USPTO July 11, 2002.	
		SREENIVASAN et al., "Step and Repeat Imprint Lithography Processes," U.S. Patent Application	
	A36	10/194,99. Filed with USPTO July 11, 2002.	
	+	OTTO M. et al., "Step and Repeat UV-Nanoimprint Lithography: Material Issues," Nanoimprint and	
	A37	Nanoprint Technology Conference, San Francisco, December 11-13, 2002.	
		JOHNSON, et al., "Advances in Step and Flash Imprint Lithography, " SPIE Microlithography Conference,	+
	A38	February 23-28, 2003.	

Examiner	Date
	Considered
Signature	Considered

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>&</sup>lt;sup>1</sup>Unique citation designation number. <sup>2</sup>Applicant is to place a check mark here if English language Translation is attached.

Approved for use through 10/31/2002. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Substitute for form 1449B/PTO				Complete if Known	
Caboute		-		Application Number	10/614,716
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Filing Date	07/07/03
				First Named Inventor	Sreenivasan et al.
				Group Art Unit	1732
(use as many sheets as necessary)				Examiner Name	Unassigned
Sheet	5	of	5	Attorney Docket Number	P90/MII-51-33V50

OTHER PRI	OR ART -	NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		CHOI et al., "A Chucking System and Method for Modulating Shapes of Subtrates," U.S. Patent Application	}
	A39	10/293,224. Filed with USPTO on November 13, 2002.	
		VOISIN, "Methods of Inspecting A Lithography Template," U.S. Patent Application 10/293,919. Filed with	
	A40	USPTO on November 13, 2002	
		CHOI et al., "A Method For Modulating Shapes of Substrates," U.S. Patent Application 10/316,963. Filed	T
	A41	with USPTO on December 11, 2002.	
· · · · · · · · · · · · · · · · · · ·		NIMMAKAYALA et al., "Magnification Correction Employing Out-of-Plane Distortion of a Substrate," U.S.	
	A42	Patent Application 10/735,110. Filed with USPTO on December 12, 2003.	
			1
		·	_
			ŀ
			+
		·	_

Examiner	Date	
Signature	Considered	
Olgitature		

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>&</sup>lt;sup>1</sup>Unique citation designation number. <sup>2</sup>Applicant is to place a check mark here if English language Translation is attached.